Loop-AM3440-E
IP/TDM DCS-MUX

Features

Cross Connect Capability

- Support full non-blocking DS0 cross connect matrix between TDM interfaces and TDMoE Pseudowires
- Suitable for DACS (Digital Access Cross-Connect System) and ADCB (Add/Drop Channel Bank) applications
- Auto A-law/μ-law conversion

Ethernet Interface

- 2 x Combo GbE (SFP 100/1000BaseFX and 10/100/1000BaseT)
- IEEE 802.3ad Ethernet Link Aggregation*

Pseudowires

- Up to 64 concurrent pseudowires
- Encapsulation format
  - SAToP
  - CESoPSN
  - MEF-8 (CESoETH)
- Configurable CoS and VLAN
- Packet Delay Variation Compensation Depth up to 256 ms

Timing

- System clock source can be chosen from Internal, External or E1/T1 Line with SSM
- Automatic/Manual Clock Recovery modes
- Adaptive Clock Recovery for Pseudowires
- Jitter and Wander conforms to G.823/824 for Traffic Interface
- SyncE

Management

- RJ45 Ethernet management interface
- SNMPv1/v3, compatible to SNMP-based GUI network management systems and supported by Loop-iNET and Loop-iNMS
- Telnet and SSH v2
- Web GUI Configuration*
- USB console port with VT-100 menu driven interface
- 64K timeslot inband management
- Support Access Control List (ACL)

Mechanical and Electrical

- 1U height, 19" rack width. ANSI shelf.
- Up to 7 mini-slots for AM3440 series interface modules.
- All plug-in interface modules are hot swappable
- Up to two ±48Vdc or 100 ~ 240 Vac hot swappable power modules
- Dual DC or AC power with load sharing
- Temperature range from -20° to 65°C
- RoHS compliant

Model	AM3440-E
Chassis	1U
# of Mini-slots	5
# of HS-slots (Also apply to mini plug-in module via HS-Slot adapter)	2
Max. E1 Ports	28
Max. T1 Ports	28
Cross-Connect Backplane Capacity	184 Mbps

Description

*Future Option

The Loop-AM3440-E is the latest product in the Loop Access DCS-MUX series that combines various access interfaces and transport over GbE or E1 uplinks. The Loop-AM3440-E supports SAToP/ CESoPSN/ MEF8 Pseudowire Protocols to transport TDM data streams with timing information over packet switched network.

The Loop-AM3440-E provides full non-blocking DS0 cross-connect matrix for up to 28 x E1/T1 + 64 Bundles. Traffic grooming and segregation between the TDM interfaces and the Pseudowires provides flexibility and efficiency, and makes the Loop-AM3440-E an ideal solution for DACS (Digital Access Cross-Connect System) and ADCB (Add/Drop Channel Bank) applications.

With hot-pluggable mini size slots design, the Loop-AM3440-E provides access for E1, T1, FOM, FXS, FXO, E&M, Magneto*, C37.94, RS232, X.21, EIA530 and V.35 interfaces. These interfaces are compatible with other Loop products.

Table of Tributary Modules Applicable to AM3440-E

Mini-Slot Tributary Modules	Description	Supported by AM3440-E
1T1	1-channel T1 interface card	✓
1E1(E75)	1-channel E1 plug-in card with 75ohm	✓
1E1(E120)	1-channel E1 plug-in card with 120ohm	✓
4E1(M4E75)	Mini Quad E1 plug-in card with 75ohm	✓
4E1(M4E120)	Mini Quad E1 plug-in card with 120ohm	✓
4T1(M4T1)	Mini Quad T1 plug-in card	✓
M1C37	1-channel C37.94 mini plug-in card	✓
1X.21 (1X21)	1-channel X.21 plug-in card	✓
Router-A	2-LAN ports/64WAN port router/bridge plug-in card	✓
FOM	Fiber Optical Module	✓
1V.35 (1V35)	1-channel V.35 plug-in card	✓
1EIA530 (1E530)	1-channel EIA530 plug-in card	✓
1RS232 (1RS232)	1-channel RS232 plug-in card	✓
QEMA	4-channel E&M voice plug-in card	✓
QFXSA	4-channel FXS voice plug-in card	✓
QFXO	4-channel FXO voice plug-in card	✓
QMAGA	4-channel Magneto voice plug-in card	*
ECA	Echo Cancellation plug-in card	✓
ABRA	Analog Bridging plug-in card	✓
GbE	GbE Module for HS slots	*
PoE+	GbE Module with PoE+ for HS slots	*

Note: ✓ = Supported   * = Future Option

Ordering Information

To specify options, choose from the list below:
Note: RoHS compliant units are identified by the letter **G** at the end of the ordering code.

Main Unit

Model	Description	Note
Loop-AM3440-CHEA-**G**	1U high Wideband Main Unit with fixed controller, cross-connect and TDMoE unit onboard.	• AM3440-E type chassis with CPU. • Please order SFP modules separately from SFP optical modules brochure. • Includes two High Speed Slot Adapters for mini plug-in cards to be used in H1 and H2 slots.

Mini Plug-in Module (Select 1 to 7 cards from list below)

Model	Description	Note
Loop-AM3440-E-1T1-**G**	1-channel T1 interface card	
Loop-AM3440-E-1E75-**G**	1-channel of E1plug-in card w/ 75 ohm	
Loop-AM3440-E-1E120-**G**	1-channel of E1 plug-in card w/ 120 ohm	
Loop-AM3440-E-M4T1-**G**	Mini Quad T1 plug-in card	
Loop-AM3440-E-M4E75-**G**	Mini Quad E1 plug-in card with 75 ohm	Includes a three meter conversion cable (Loop-ACC-CAB-DB25M-300-8BNCM)
Loop-AM3440-E-M4E120-**G**	Mini Quad E1 plug-in card with 120 ohm	Includes a three meter conversion cable (Loop-ACC-CAB-DB25M-300-4RJ48M)
Loop-AM3440-E-M1C37-**LSFOM**-**G**	1- channel C37.94 plug-in mini card	For **LSFOM** option, please refer to the table below for detail information
Loop-AM3440-E-RTA-**G**	2-LAN ports/64 WAN port router/bridge plug-in card	
Loop-AM3440-E-FOM-**opt**-**G**	Fiber Optical plug-in card	For **opt** option, please refer to the table below for detail information
Loop-AM3440-E-1V35-**G**	1-channel V.35 plug-in card	
Loop-AM3440-E-1E530-**G**	1-channel EIA530 plug-in card	
Loop-AM3440-E-1X21-**G**	1-channel X.21 plug-in card	
Loop-AM3440-E-1RS232-**G**	1-channel RS232 plug-in card	
Loop-AM3440-E-QEMA-**wr**-**m**-T**n**-**x**-**G**	Jumper selectable: 2/4 WIRE; A/B side Quad E&M voice card, complied with IEEE1613 standard.	• For -48 Vdc and AC (100 to 240 Vac) power supply only. • For **wr**, **m**, **n** and **x** option, please refer to the table below for detail information
Loop-AM3440-E-QFXO-**x**-**G**	Quad FXO voice plug-in card used with 4 RJ11	• GS = Ground Start • MP = Metering Pulse Receive 12/16 KHz • For -48 Vdc and AC (100 to 240 Vac) power supply only. • For **x** option, please refer to the table below for detail information.
Loop-AM3440-E-QFXO-M-**x**-**G**	Quad FXO with MP 16 KHz voice plug-in card used with 4 RJ11	
Loop-AM3440-E-QFXO-M12-**x**-**G**	Quad FXO with MP 12 KHz voice plug-in card used with 4 RJ11	
Loop-AM3440-E-QFXO-GS-**x**-**G**	Quad FXO with GS plug-in card used with 4 RJ11	
Loop-AM3440-E-QFXO-GM-**x**-**G**	Quad FXO with GS and MP 16 KHz voice plug-in card used with 4 RJ11	
Loop-AM3440-E-QFXSA-**x**-**pt**-**G**	Quad FXSA voice plug-in card	• Jumper setting options: Loop

Loop-AM3440-E-QFXSA-M-**x-pt-G**	Quad FXSA with MP 16 KHz voice plug-in card	Start, Ground Start (GS), Metering Pulse Transmit 12/16 KHz (MP).
Loop-AM3440-E-QFXSA-M12-**x-pt-G**	Quad FXSA with MP 12 KHz voice plug-in card used	• For **x** & **pt** option, please refer to the table below for detail information.
Loop-AM3440-E-QFXSA-GS-**x-pt-G**	Quad FXSA with GS plug-in card	
Loop-AM3440-E-QFXSA-GM-**x-pt-G**	Quad FXSA with GS and MP 16 KHz voice plug-in card	
Loop-AM3440-E-QMAGA-**G***	Quad channel magneto plug-in card	
Loop-AM3440-E-ECA-**G**	Echo canceller card	
Loop-AM3440-E-ABRA-**G**	Analog Bridge Card	*Future Option

Accessories

Power Module

Loop-AM3440-E-SAC-**G**	Single AC plug-in power supply (100 to 240 Vac, 50/60 Hz)	• For AC, choose an appropriate power cord.
Loop-AM3440-E-SDC-**G**	Single -48 Vdc (-36 to -72 Vdc) Power Module	• Order two DC or two AC or (one DC and one AC) power modules for redundancy.

Power Cord (All power cord are RoHS compliant)

Loop-ACC-PC-USA	AC power cord for Taiwan/America	
Loop-ACC-PC-EU	AC power cord for Europe	
Loop-ACC-PC-UK	AC power cord for UK	
Loop-ACC-PC-AUS	AC power cord for Australia	
Loop-ACC-PC-CH	AC power cord for China	

Power Adaptor (All power adaptor are RoHS compliant)

Loop-ACC-APA-240-**G**	240 Watt, AC (3.6A, auto sensing) to DC (+48 Vdc, 5A) adaptor for USA	
Loop-ACC-APE-240-**G**	240 Watt, AC (3.6A , auto sensing) to DC (+48 Vdc, 5A) adaptor for Europe	
Loop-ACC-APU-240-**G**	240 Watt, AC (3.6A, auto sensing) to DC (+48 Vdc, 5A) adaptor for UK	

HS-SLOT ADAPTER

Loop-ACC-HSADTa-**G**	Mechanical adapter for HS-Slot.	

Mounting Ear

19"/23" ear mounts	A pair of 19"/23" ear mounts is supplied as part of standard package. **Note**: For other sizes, please contact your nearest Loop sales representative.

Conversion Cables (All conversion cables are RoHS compliant)

Loop-ACC-CAB-DB25M-300-8BNCM-**G**	DB25/Male to eight BNC/Male cable; Length: 300 cm	Used in Loop-AM3440-M4E75-**G**
Loop-ACC-CAB-DB25M-300-4RJ48M-**G**	DB25/Male to four RJ48C/Male cable; Length: 300 cm	Used in Loop-AM3440-M4E120-**G** and Loop-AM3440-M4T1-**G** plug-in card
Loop-ACC-CAB-DB25M-30-1M34F-**G**	DSUB-25pin/Male to M34/Female V.35 Conversion cable Length: 30 cm	Used in Loop-AM3440-1V35-**G** plug-in card

Blank Panels (All blank panels are RoHS compliant)

30.002582.A00LF-**G**	Blank Panel for Power Supply Slot (flat)	
30.000112.A00-**G**	Blank Panel for mini Slot A-E (flat)	
30.002583.A00LF-**G**	Blank Panel for H1 and H2 slot (flat)	

Y-Box (All Y-Box are RoHS compliant)

Loop-VV-B-**G**	1 for 1 protection Y-Box with BNC connectors (4-E1)	Used with M4E75
Loop-VV-R-**G**	1 for 1 protection Y-Box with RJ48C connectors (16-E1)	Used with M4E120 and M4T1

User's Manual (RoHS compliant)

Loop-AM3440-UME	Optional hard-copy (paper) User's Manual. A CD version of the manual is already included as standard

	package.	

For QEMA card (Quad E&MA card):

■ where **wr** is used to select wire type:

wr =	Description	Notes
2w	2 wire	
4w	4 wire	

■ Where **m** is used to select QEM card signaling side (must select one):

m =	Description	Notes
B	B (carrier side) connects to A side.	
A	A (exchange side) connects to B side. A side M lead to B side M lead, A side E lead to B side E lead.	

■ Where **n** is used to select QEM card signaling type (must select one):

n =	Description	Notes
O	For voice transmission only.	Circuit Type doesn't matter.
1	Type I (Original) E&M Signaling Circuit	M lead provides discharge for the A side.
2	Type II Circuit. This design attempts to reduce ground noise by adding two leads: SB (Signal to Battery) and SG (Signal to Ground)	Reduced ground noise. Ground current is eliminated at the cost of two more wires per circuit.
3	Type III Circuit. The SG lead serves as a discharge for the M lead. Reduces delay caused by combination of (a) low current electronic detectors, and (b) long runs of the E and M leads.	Type III is rare because ground currents on the E return would cause noise
4	Type IV Circuit. Based on the Type 2 circuit. This E&M circuit provides symmetry.	
5	Type V Circuit. For applications where ground noise is not an issue. Based on the Type 2 circuit.	

For voice card (QEMA/QFXO/QFXSA):

■ Where **x** is used to select all of voice card signaling bits. If this option is not required, omit the **x** field in the ordering code.

QEMA	E	Follows ETSI signaling bits	
	A	Follows ANSI signaling bits	
	S	Follows customer's special bits assignment	
QFXO	A	Follows ANSI signaling bits	
	S	Follows customer's special bits assignment	
	E	Follows ETSI signaling bits	
	T	Trunk condition OFF-HOOK	
	AT	Follows ANSI signaling bits w/ trunk condition OFF-HOOK	
	ST	Follows customer's special bits assignment w/ trunk condition OFF-HOOK	
QFXSA	A	Follows ANSI signaling bits	
	E	Follows ETSI signaling bits	
	S	Follows customer's special bits assignment	

Note:

1. For S (customer's special bit), please contact your nearest Loop sales representative.
2. If **x** is not selected from table above, the default setting for signaling bits is ETSI and for trunk condition is ON-HOOK.

For QFXSA:

■ Where **pt** is used to select the power :

pt=	Description	Notes
PWR	complied with ±48 Vdc (SDB) and AC (SAB) power modules	

For mini LS Optical module (mini C37.94):

■ Where **LSFOM** is to select **LS-F**iber **O**ptical **M**odule option, each module has 5 letters.

LSFOM	Description									
	Mode		Data Rate		Wave Length		Distance		Connector	
Code	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
ZHHTT	Z	Multi-mode	H	155 M	H	820nm	T	2km	T	ST connector
QHATT	Q	Multi-mode	H	155 M	A	850nm	T	2km	T	ST connector
NFB3T	N	Single mode	F	125 M	B	1310nm	3	30km	T	ST connector
QFBTT	Q	Multi-mode	F	125 M	B	1310nm	T	2km	T	ST connector
NHC2S	N	Single mode	H	155 M	C	1550nm	2	20km	S	SC connector

For FOM card

■ Where **opt** is used to select optical module type (All optical modules are RoHS compliant):

opt =	Description	Note
SAA	Single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 30 km - *S1.1*	Use dual fiber Units delivered ITU-T G.957 application code
SBB	Single optical module with dual uni-directional fiber, 1310 nm, SC optical connector, 50 km – *L1.1*	
SCC	Single optical module with dual uni-directional fiber, 1310 nm, FC optical connector, 30 km – *S1.1*	
SDD	Single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 20 km – *S1.2*	
SEE	Single optical module with dual uni-directional fiber, 1550 nm, SC optical connector, 100 km – *L1.2*	
SSM	Single optical module with single bi-directional fiber (master), 1310 nm transmit and 1550 receive, SC optical connector, 30 km – *S1.1/ S1.2*	1310 nm from master to slave Order **SSM** to use with **SSS** Use 1 fiber ITU-T G.957 application code
SSS	Single optical module with single bi-directional fiber (slave), 1310 nm receive and 1550 transmit, SC optical connector, 30 km - *S1.1/ S1.2*	1550 nm from slave to master Order **SSS** to use with **SSM** Use 1 fiber ITU-T G.957 application code

Note: For other special optical modules, please contact your nearest Loop sales representative.

CCPA Controller on-board Combo Gigabit Ethernet (GbE) Interface for TDMoE Services

Number of Ports	2
Speed	10/100/1000M bps
Connector	RJ45 for twisted pair GbE, LC for optical GbE, auto detection
Ethernet Function	
Basic Features	MDI/MDIX for 10/100/1000M BaseT auto-sensing
	Ping function contained ARP
Pseudowire	
Concurrent PW	Up to 64
Encapsulation Format	SAToP, CESoPSN, MEF-8 (CESoETH)
QoS	User configurable 802.1p CoS, ToS in out-going IP frame
Clock Source	Internal, Line Interface, External (E1/T1/2048 KHz), Adaptive Clock Recovery for Pseudowires, SyncE
Alarm Relay	Max. Current: 1A for 24VDC, 0.625A for 48VDC
	Fuse alarm, performance alarm
Management	
Console	Micro USB Connector

	User Interface: Menu driven VT-100
Ethernet	2 Combo GE port, Connector: RJ45 & SFP
	SNMPv1/v3, Telnet/SSH, support Radius client function
Inband Management	Inband 64 Kbps, support HDLC/PPP
System Configuration Parameters	Active Configuration, Stored Configuration, and Default Configuration (Stored in Non-volatile Memory)
Performance Monitor	
Performance Registers	Last 24 hours performance in 15 minute intervals and last 7 days in 24 hour summaries
Separate Registers	Network, user, and remote site
Performance Reports	Reports include E1 Bursty Errored Second, Severe Errored Second, Degraded Minutes. Also available in Statistics (%)
Alarm Queue	To record the latest alarm type, location, date and time
Threshold	Bursty Seconds, Severely Errored Second, Degraded Minutes
Diagnostics	
Loopback	E1/T1 interface (Line Loopback, Payload Loopback, Local Loopback), DTE Loopback (DTE-to-DTE, DTE to Line)
Test Pattern	For Controller: 2^{20}-1, 2^{15}-1, 2^{11}-1, 2^9-1, and 4-byte user define pattern
Front Panel	
Controller LED Indicators	Power, ACTIVE, ALARM

Physical /Electrical

Dimensions	442 x 44 x 297 mm (W×H×D)	
Power	Single/ Dual -48 Vdc (-36 to -72 Vdc Single/ Dual AC plug-in power supply (100 to 240 Vac, 50/60 Hz)	
Temperature	Operating	Storage
	-20 to 65°C	-30 to 70°C
Weight	Net Weight	Max. Weight
	5.5 Kg (12.13lbs)	7.5 Kg (16.53lbs)
Humidity	0-95%RH (non-condensing)	
Mounting	Desk-top stackable, 19" /23" rack mountable	
Power Consumption	Max 30 Watts	

Certification
EN55032 Class A, EN50024, FCC Part 15 Class A, EN62368-1

Compliance
ITU G.703, G.704, G.706, G.732, G.736, G.823, G.826, G.711, G.712, G.775, O.151, V.11, V.28, V.54
IETF SNMP v.3 (RFC2571~2575), ITU-T Rec.G.821, ITU-T Rec.G.827

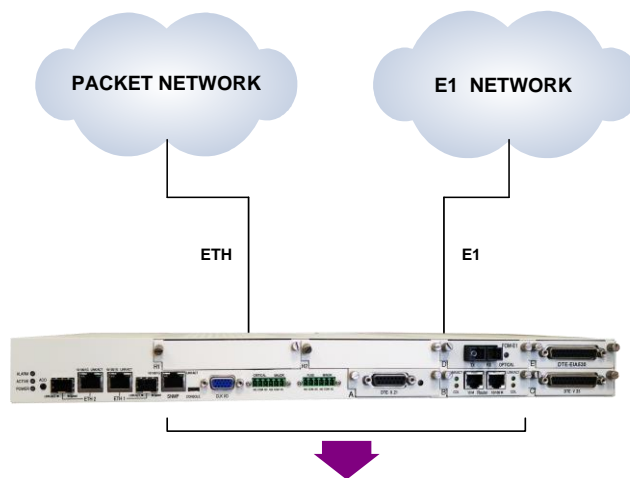**Data Comm for Business, Inc.**
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Application Illustration

PACKET NETWORK

E1 NETWORK

ETH

E1

Mini Slot Plug-in Cards

→ 1-channel T1 interface card
→ 1-channel E1 plug-in card with 75ohm
→ 1-channel E1 plug-in card with 120ohm
→ Mini Quad E1 plug-in card with 75ohm
→ Mini Quad E1 plug-in card with 120ohm
→ Mini Quad T1 plug-in card
→ 1-channel C37.94 mini plug-in card
→ 1-channel X.21 plug-in card
→ 2-LAN ports/64WAN port router/bridge plug-in card
→ Fiber Optical Module
→ 1-channel V.35 plug-in card
→ 1-channel EIA530 plug-in card
→ 1-channel RS232 plug-in card
→ 4-channel E&M voice plug-in card
→ 4-channel FXS voice plug-in card
→ 4-channel FXO voice plug-in card
→ Echo Cancellation plug-in card
→ Analog Bridging plug-in card